RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 60-12-03

Log Event A

Borehole Information

Farm : U	**Tank :** U-112	**Site Number :** 299-W18-103
N-Coord : 37,900	**W-Coord :** 75,786	**TOC Elevation :** 664.94
Water Level, ft :	**Date Drilled :** 6/30/1973	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 125	

Borehole Notes:
This borehole was completed in June 1973 to a depth of 125 ft. The casing at the surface appears to be 6-in., schedule-40 steel tubing with a wall thickness of 0.280 in. According to the driller's records, this borehole was not perforated or grouted. The drilling log indicates coarse sand, gravel, and cobbles to a depth of approximately 50 ft and fine to medium sand below 50 ft.

Equipment Information

Logging System : 2	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1995	**Calibration Reference :** GJPO-HAN-3	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number : 1	**Log Run Date :** 12/15/1995	**Logging Engineer:** Alan Pearson
Start Depth, ft.: 124.5	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 65.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 12/18/1995	**Logging Engineer:** Alan Pearson
Start Depth, ft.: 66.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 0.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Analysis Information

Analyst : E.P. Baumgartner

Data Processing Reference : P-GJPO-1787 Analysis Date : 6/14/1996

Analysis Notes :

This borehole was logged in two log runs using the Spectral Gamma Logging System (SGLS). The pre- and post-survey field verification spectra show consistent activities, indicating the logging system was correctly calibrated. However, during log run 1, the instrumentation drift was excessive, requiring two adjustments of the fine gain. There were also two events during log run 1 where the energy versus channel number calibration changed significantly (approximately 3 and 4 keV) in a stepwise manner. Because of these unusual difficulties, log run 1 required four separate energy versus channel number recalibrations during processing of the data to maintain proper peak identification. A depth overlap, where data were collected on separate days at the same depth, occurred in this borehole at about 66 ft. The calculated concentrations of the natural radionuclides in the overlap zone were within the statistical uncertainty of the measurements, indicating very good consistency for the logging system.

The casing thickness is presumed to be 0.280 inch (in.), on the basis of the published thickness for 6-in., schedule-40 steel tubing. Casing-correction factors for a 0.280-in.-thick steel casing were applied during analysis.

Cs-137 was the only man-made radionuclide identified in this borehole. All concentrations of Cs-137 were less than 1 pCi/g, with the exception of the bottom-most assayed interval at a depth of 124.5 ft, which had a concentration of about 2 pCi/g. There is a peak of Cs-137 at 21 ft that correlates with a peak at the same depth in the total gamma count log. This peak can be identified on all of the historic Tank Farm gross gamma count logs.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks U-111 and U-112.

Log Plot Notes:

Separate log plots show the man-made (e.g., Cs-137) and the naturally occurring radionuclides (K-40, U-238, and Th-232). The natural radionuclides can be used for lithologic interpretations. The headings of these plots identify the energy of the specific gamma peaks used to calculate the concentrations.

A combination plot includes the man-made radionuclides, the naturally occurring radionclides, the total gamma count derived from the SGLS and the WHC gross gamma log. The gross gamma plot displays the latest available digital data from WHC with no attempt to adjust the depths to coincide with the SGLS data.

Uncertainty bars on the plots show the statistical uncertainty for the calculated concentrations at the 95-percent confidence level. The minimum detection level (MDL) is shown by open circles on the plots. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.